Balkan Energy Solutions Team

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Introduction

In this issue several activities regarding energy efficiency and ecology in the Balkan Region were noticed by BEST. In Belgrade FOCUS group was giving lectures in ecology and send us their paper. Also, Canadian ESCO organization was giving lectures on energy efficiency in Croatia, Bosnia and Herzegovina and Serbia, while their paper is present in this issue, as well.

In October a physical reconnection of UCTE 1 and UCTE 2 synchronous zones happen so power flows between central and southeast Europe starts to flows. Commercial agreements will be possible form 1st of November 2004, was announced by UCTE.

Report from the Slovenian power exchange is given and technical paper that gives overview on the transfer capacities definition in the region issued by ETSO.

Wish You pleasant readings and looking forward to receive your papers, materials, adverts and works.

Sincerely,

BEST

Energy Efficiency

Stuck in the Past - Energy, Environment and Poverty

Serbia and Montenegro

Full version, 137 pages, download from the link:

http://www.undp.org.yu/files/news/200409_newsletter.pdf

Energy use in Serbia and Montenegro is unsustainable, retarding growth, poverty reduction and human development.

Drawing on new information obtained from three surveys (energy use patterns, perception about energy processes and services, and details about energy providers) and series of focus groups, this report finds that while nearly half the population has been marginalized by the energy-poverty nexus, more than a quarter of the population is socially secure primarily because of the energy-related subsides they enjoy.

Consider these other findings:

- Average energy consumption per square meter of living space is about 2.5 times greater than in Northern Europe, yet in more than one in four households the amount of heated space per person is below minimum health standards,
- Mortality is 30% or more higher in winter than the monthly average, with poor households disproportionately affected
- …

To accelerate growth, reduce poverty and improve living standards, Serbia and Montenegro needs comprehensive policy reforms to establish an enforceable concept of poverty rights and public goods; build capacity; improve institutional and corporate governance; develop better long-term policy planning; improve information flows and structures; strengths coordination between energy, health and poverty policies; and enhance international cooperation.

To improve energy efficiency and reduce poverty the new energy policy should remedy the uneven distribution of welfare benefits, especially the sizeable cross-subsidy from poor to rich. Implementing energy efficiency measures could contribute to a boost in the GDP growth rate to 5 – 7% a year leap that no other policy change could achieve.

The evolution of ESCOs in Developing Countries and Economies in transition

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In a world where climate change issues are getting higher priorities, organizations throughout the world a getting more involved in trying to find solutions to mitigate the impact of air pollution that results from the carbon and other emissions produced by energy production and consumption. One of the obvious solutions that make a consensus with all the stakeholders is certainly energy efficiency activities that not only makes environmental sense, but that has also an economical benefit for the final users.

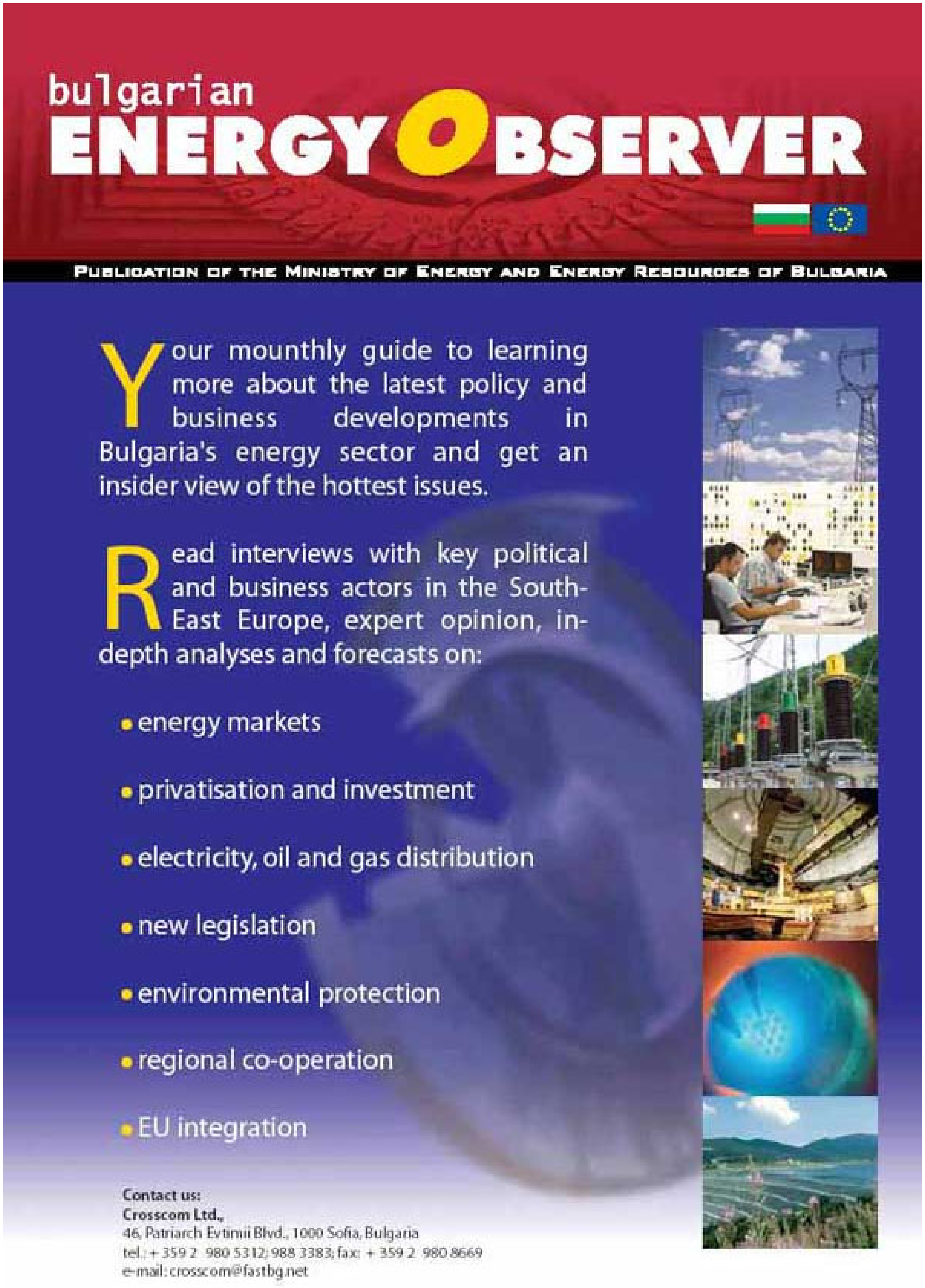
So, why is energy efficiency potential has not been even partly exploited in most countries in the world, especially in the developing ones and in the ones with economies in transition who could probably benefit the most from these projects?

The answer to this question is a surely a complex one. But in the last twenty years, a potential solution to help get over a good numbers of barriers to energy efficiency projects implementation have come from a approach that is promoted by companies that call themselves Energy Services Companies, or ESCOs.

ESCOs can be defined as company that offer integrated services (technical and financial) for the implementation of energy efficiency project and that provide a guarantee that the energy savings generated by the project will be sufficient to reimburse all the implementation cost over a certain period of time defined by contracts.

The ESCO concept started about twenty (20) years ago in United States, Canada and England, and expanded rapidly in other part of the world, like Western European countries in the mid 1980s and in some Asian countries during the early 1990s.In developing countries and with the ones with Economies in transition though, this concept has only been introduced in recent years, mainly due to the pressure that the environmental community is putting worldwide to have all countries participate in a cleaning up effort to limit the climate change process that is currently underway and that started to show its effect pretty strongly recently.

Countries like Croatia, Czech Republic, Egypt, Hungary, Poland, Thailand and Ukraine have seen International Institutions financed all type of projects to support the development of ESCO and ESCO projects. Furthermore, many governments are implementing more global strategies dedicated to the development of ESCOs on their territories. Some other countries benefited for an introduction on the ESCO concept directly from the private sector supported by International ESCO operators, like



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India, Jordan, South Korea, Tunisia and United Arab Emirates

Great quantities of barriers related to the development of ESCO activities though are still present in most countries. First, the lack of structured energy efficiency strategy in the country and the limited knowledge of the proposed concept from both clients and government constitute the bigger obstacles to that development. Secondly, the difficulties to propose adapted financing mechanisms for Energy Efficiency projects constitute one of the major obstacles after awareness about the numerous and important benefits of energy efficiency projects in generally and ESCO projects particularly.

When analyzing the strategies used in countries that are either in the process of developing or have successfully developed the market of ESCO, it can be concluded that, in most of the cases, the action of the governments was fundamental and indispensable. The governmental support for development of this type of industry can be achieved by creating a favourable environment for their growth and by removing or reducing some of the market entry barriers. Programs that facilitates the access to the market (information dissemination, demonstration programs) were the most used form of support programs and their intent was to accelerate the acceptance of the ESCO business model by the clients. In countries were financing mechanisms for Energy Efficiency are unavailable, , like most developing countries and countries with economies in transition, the implementation of a strong ESCO industry required the development of a financing support structure to permit the achievement of the first projects. Most financial support mechanisms put in place gradually reduced their incentives to let the private sector develop their own financing mechanisms adapted for the performance contracting industry.

Independently of the type of mechanisms that were applied, the level of success in the development of an ESCO industry in a country depends fundamentally on the knowledge and abilities of the stakeholders for the concept adaptation. The different contexts of the targeted market and the possibilities for adjustment to its demands and market parameters, constitute a major part for a successful introduction on the Market and on its sustainability..

The following table summarize the various barriers faced by ESCO in developing a given market. An indication is given when the barrier is mainly applicable to foreign investor intending to invest in a country. "Manageable "means that the barrier could be managed by the ESCOs by putting in place appropriate internal procedure for client selection, technology to use and risk control mechanism within the contract. If the barrier is not manageable by the ESCO itself, it is indicated by the world « external » in the table below.

Category	Barrier description	Type of barrier
Technological	Availability of high efficiency equipment	Manageable
	Cost of equipment in the market	Manageable
	Skills for design, installation, operation and maintenance	Manageable
	Local support for technical guarantee	Manageable
Commercial	Low energy rates	External
	Customer education	Partially
	Market access barrier	Manageable
	- Institutional market regulation	External
	- Institutional market budgeting procedures	External
	- Commercial market lenders	Manageable
	- Industrial process expertise	Manageable
	No reliable historic consumption data for client	Manageable
Political	Political instability	External
	Risk of nationalization of foreign assets	External
	Foreign investment regulation	External
Economic	Exchange rate stability	External
Legal	Contract enforcement delays	External
	Complexity of performance contract	Partially Manageable
Fiscal	Income tax (in comparison to other countries)	External
	Capital repatriation rules	External
	Fiscal treatment of dividend	External
Financial	Unavailability of funding for long term	External
	Unfavourable conditions (high down payment, high interest, collateral's)	External

In conclusion, we can say that ESCO can certainly be considered as one of the most interesting tools to help implement energy efficiency projects, in all type of countries, including the developing ones and the ones with economies in transition. However there are still a lot of barriers that will have to be addressed in most countries to be able to benefit from all the potential that these organizations could bring to the Energy Efficiency market. We believe that government actions and support is an essential component of the creation and the expansion of this market since ESCOs through their activities bring a great benefits, both on the environment and economical side, to achieve government environmental and financial objectives.

ECONOLER INTERNATIONAL

Econoler International is a Canadian company specializing in the energy efficiency, renewable energy, clean energy production and clean development mechanisms sectors. Over the last 20 years, Econoler International has realized more than 3,000 projects around the world, being active in industrialized, in transition or in developing countries.

Econoler International has worked, either through subsidiary ventures, licensing agreements or technological support in the implementation and operation of over 30 ESCOs in Africa, Asia, Europe, the Middle East and the Americas.

In the Balkan regions, Econoler International is currently involved in the development and support of the ESCO concept through a project financed by the Canadian International Development Agency (CIDA).

Biographie: Mr. Jalel Chabchoub is a project director for Econoler International. He is presently based in Croatia for the next 2 year as the main technical expert on a World Bank project. Over the last five years, he has implemented many energy efficiency projects in different countries.

Having gained a great experience in the industrial sector through his work and his master degree in Industrial engineering, M. Chabchoub joined the ranks of Econoler International as a senior energy auditor for its newly created ESCO. He has a valuable experience in energy efficiency audits realization, projects implementation and M&V processes. Over the last five years, he has been in charge of the development and the implementation of over 50 projects in the industrial, commercial and services sectors, including diverse projects with energy efficiency measures adapted to the Maghreb region.

On top of the important experience gained in Maghreb region, Mr. Jalel Chabchoub has also participated in many international projects mainly in Algeria, Bahrain, Canada, Côte d'Ivoire and Cameroon, for which he was in charge of conducting and reviewing audits and implementation plans, developing market study, designing DSM projects and other related activities.

(book: list of data about: Who's Who at Electric Power Plants - International)
http://www.udidata.com

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Electricity Markets

TRADING IN A DEREGULATED MARKET

(part three)

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1. **What Products are traded and what form do deregulated power markets take? – Wholesale power – futures and options**

There are very few exchange cleared electricity products today. With the exception of exchanges such as Nordpool and the UKPX most traded electricity forwards and options are arranged by an over-the-counter (OTC) broker either on a telephone or using a web based electronic platform.

The deals are arranged with counterparties that have credit arrangements with each other. The broker forms a professional relationship between all counterparties and each day places the counterparty's respective orders on the market for all the market to see. Every producer, supplier and power trading house will have a team who manage and trade their company's position. Once a deal has been arranged, the broker will publish the traded price and the direction of the trade.

An ideal market comprises of a homogeneous product range where buyers and sellers can find each other easily and perfect information is available.

Arbitrage opportunities are vast in the UK power market and simple calculators like the example shown in Figure 4.2 are used to extract further value from the market by exploiting open market price discrepancies. Since a baseload product comprises 24 hours of a trading day, it is possible to trade separate portions.

Q1/04				Q2/04			Q3/04			Q4/04		
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
01-04	05-08	09-13	14-17	18-21	22-26	27-30	31-34	35-39	40-43	44-47	48-52	
24.5	23.5	18.8	13.9	14.05	14	13.9	13.95	14.3	22.7	21.66	17.85	Win04
	22			13.98462	14		14.06923			20.51462		21.83
				18.46	14.03		18.1			21.4		20.64
Q1/05				Q2/05	-0.05		Q3/05			Q4/05	18	
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
01-04	05-08	09-13	14-17	18-21	22-26	27-30	31-34	35-39	40-43	44-47	48-52	
23.3	22	17.75	13.95	14.1	14.1	14.1	14.15	14.5	22.78	21.75	18	Win05
	20.76538			14.05385	14.125		14.25			20.62462		26.875
	20.7				14.15		18.4					24.85077
Q1/06				Q2/06	2.8		Q3/06			Q4/06	21.85	
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
01-04	05-08	09-13	14-17	18-21	22-26	27-30	31-34	35-39	40-43	44-47	48-52	
35	32	22	17.7	17.5	17.5	14.2	14.7	17.2	20	23.2	27.1	Win06
	29.07692			17.56154	16.1		15.50769			23.71538		
	22.7				16.53							

PEAKLOAD	22.00	23.00	20.426
OFFPEAKS	14.00	15.222	15.75
BASELOAD	16.857	18.00	17.42

Now we know the trader can execute different shape profiles according to the company's needs. This typically depends on either the type of generation verses efficiency or a customer base a supplier might cater for. Electricity is usually divided into portions of time.

For example in the UK.

• Baseload (24 hours) begins 2300hrs of the previous day finishing 2259hrs or blocks 1,2,3,4,5 and 6
• Peaks (12 hours) begins 0700hrs to 1859hrs of each weekday day or blocks 3,4,5
• Overnights (8 hours) begins 2300hrs of the previous day ending 0659hrs or blocks 1 and 2
• Blocks 1,2,3,4,5 and 6 for weekend and weekday can be traded individually

In order to fine-tune electricity profiles the trader can choose bespoke shapes and profiles that stretch over a specific period of time. As shown above a day of power is divided into 6 blocks of 4 hours so a trader can in fact transact a specific block stretching over any time period in the forwards market.

A trader can also transact half-hour blocks, which generally trade intra-day towards gate closure.

Options are a valuable hedging tool that are used in various ways to minimise risk.

All these products can be used to maximise value from any position in the market whether it be asset or non-asset based. The key is to understand all of these products and how they can be used in the execution of an effective trading strategy.

5. Factors affecting prices within a deregulated power market

Power markets differ to oil and gas as their parochial geographical and political characteristics differ from region to region. The market's location will dictate the currency the market is traded in, as well as the types of generation available balanced with demand. Power markets are parochial and therefore the traded market is driven by local conditions such as weather and regulatory risk. The following list identifies some of the factors that will affect power prices within a deregulated market.

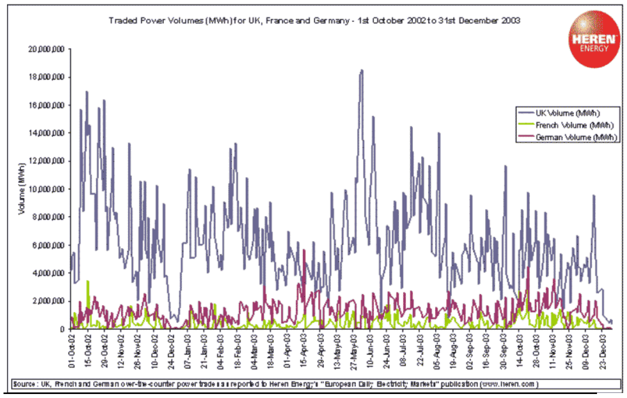
Some of these are common along the curve while some exclusively affect particular segments:

- Weather: The main factor affecting wholesale power prices is the weather. This effect is generally only seen on prompt prices and manifests itself in different ways across the power system. The main influence is on the demand side. Temperature changes can influence the need for heating demand (in the winter) and cooling demand (air conditioning in the summer). Factors such as cloud cover can also have an influence, as this will affect lighting demand. On the supply side, pressure changes associated with particular weather patterns can have an effect on the thermal efficiency of power stations, thereby increasing or decreasing power flow onto the transmission network;
- Fuel Prices: The main cost associated with power generation is the purchase of the input fuel. Therefore, as the market price for fuels such as coal, gas and oil (due to oil's effect on the price of natural gas) fluctuates, so does the price of wholesale power, although the relationship between the two is not always clear-cut. In France, much of the generation is nuclear and as such, the marginal cost is considered to be low. This explains why France is a large power exporter;
- Green Energy and Emissions: One of the major factors influencing the power market at the moment is green energy, and more specifically the EU Emissions Trading Scheme (ETS) planned for 2005. The current UK ETS scheme specifically excludes power generation. This exclusion is dropped in the EU ETS scheme. This will add a significant cost onto generating power, particularly less environmentally friendly plants that burn coal;
- Plant Availability: On the very prompt part of the curve sudden changes in available generation capacity can have a dramatic effect on prompt power prices. Take the example where a plant on the lower part of the marginal cost curve "trips" (i.e. suddenly stops working). There is a possibility that this could lead to an increase in prices because (i) if the power plant is already hedged on a forwards basis it will be required to go into the market and buy power thereby pushing prices up, and (ii) this lack of available capacity effectively shift the marginal cost (supply) curve to the left. The result of this is that the marginal price setting plant becomes one with a higher marginal cost associated with it. The effect of this is particularly acute if demand is high and the marginal plant is on the upper range of the marginal cost curve where it is particularly inelastic;
- Forward Plant Availability and System Margin: On the forward curve, forward plant availability and predicted system margin will have an effect on prices. This can be influenced by a number of factors including mothballing and new build;
- Prompt Affecting the Curve: There is a tendency for the prompt prices to have an effect along the forward curve, particularly the front end. This seems irrational, as cash and carry arbitrage is not possible in electricity markets as it cannot be stored efficiently. The reason for this relationship is more to do with sentiment rather than any kind of fundamental relationship;
- Cooling Water: This is an issue mainly in continental Europe, particularly France and Germany. This has been particularly relevant this summer, resulting in record price spikes in all European wholesale power markets. The issue is as follows. Nuclear plant uses water from nearby sources to cool its reactors. This water is heated through the process and then discharged back into the river, thus increasing the river's temperature. There are environmental restrictions on this practice meaning that if the river temperature increases above set limits then the plant is prohibited from discharging more water. In this scenario, the plant needs to shut down. During periods of hot weather

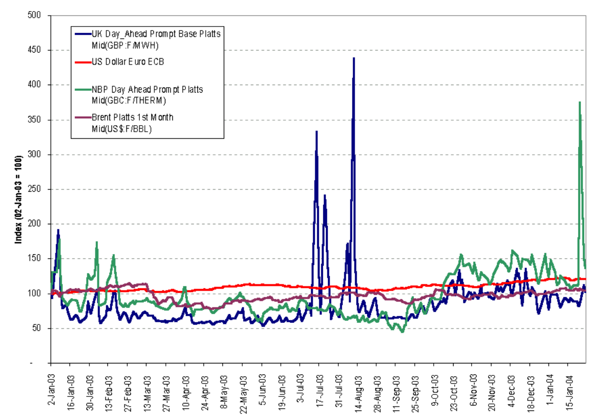
the temperature of the water is going to be higher irrespective of whether the plant is using it for reactor cooling. When the plant is using the water to cool its reactor, the already high water temperature means that it is more likely that the water temperature will rise above the prohibited level and the plant will be required to shut down.
The above list is by no means exhaustive. In summary, any factor that can affect the structure and level of demand and supply at any point in time can have an influence on power prices.
A trader's acute awareness of these conditions is a must in identifying and executing an effective trading strategy wherever they reside on the value chain.

6. What are the characteristics of a deregulated market? – Volatility, liquidity, price transparency, and balancing exposure.
It is generally considered that the more liquid the market, then the more efficiently it performs, and therefore in some cases, the less volatile a market ought to be. In comparison to other commodities, such as oil and gas, electricity is much less liquid and inherently more volatile. Liquidity directly gives us price transparency, which every marketer requires to make strategic decisions. Essential for price transparency in any market is the need to attract more participants, which in turn attracts investment for the sector it represents. We discussed earlier that one major element that stifles liquidity in power markets is the growth of vertically integrated companies. Other contributions to liquidity are the standard size of contract that is dealt. Traders feel freer to trade if the risk of making a trading decision is reduced in Megawatt hours. After the implosion of Enron counterparty credit risk restricted trading activities between the European and American players resulting in less available liquidity in the market. Geographical and regulatory factors that add to greater uncertainty in a region also imply limitations to the trader's willingness to add liquidity to the market. In Figure 6.1, one can see such an impact with a comparison of traded power volumes for UK, France and Germany.

Figure 6.1 Traded Power Volumes (MWh) for UK, France and Germany



Of course liquidity is not the only factor leading to high volatility. Power cannot efficiently be stored so any outages or other technical complications can cause vast price movements especially on the day-ahead market.
Figure 6.2 Comparison of UK day Ahead power, US Dollar Euro ECB, NBP Day Ahead and Brent 1st Month



Whilst deregulating a market produces price signals that encourage investment in regions where there is insufficient generation or interconnection capacity, it places immense pressure on the performance of the regional balancing mechanism. In a deregulated market physical players have a significant amount of control over their dispatch decisions. Traders with access to physical assets in areas where capacity is insufficient should be aware of how they can extract value from their position in these areas. All market participants should be conscious of the constraints on the local balancing mechanism, the likely costs associated with balancing actions and more importantly how these cost are recovered and how it may affect parties within the market place.
Another function of a market is price transparency. Other than breeding trust and competition, price transparency enables generators and suppliers to analyse short term and long term risk and the best strategy to manage it. It especially guides companies when making a forecast for investments

and identifies where best this investment should be directed to.

There is a certain amount of business that is not reported. This type of business is executed bilaterally between counterparties or internally within a vertically integrated company.

Planned outages play a large part in operational risk verses market risk. In a competitive market generators are reluctant to inform the market of future maintenance or outages, as this will compromise any hedging strategies. Some pools do offer a 'real time' information service as companies need to monitor ongoing outages, new generation capacity and transmission constraints. Traders need to understand the characteristics of different plants in order to maximise the effects of trading strategy and realising the benefits of their competitive position.

2. What's applicable in the Russian power market? Regional trading

Russian companies have to be maladaptive and avoid lethargy during the process of deregulation. Any internal efforts to resist change will impede the company's ability to compete. Whilst reducing superfluous workforce and lowering other costs is obviously good economics, the company will heavily depend on the ability to effectively trade the power and its fuel. Trading arms must be quickly established to maximise the value extracted from the company's portfolio. As with the characteristics of a market going through deregulation, the challenge will be to maintain satisfactory supply-demand equilibrium. One method to aid an easier transition might be to bring trading and operational experience from existing deregulated markets.

In Russia, much concern has been given to failing supply due to a shortfall of investment and an increase in demand so the market may tend to fluctuate violently. This in turn may ward off potential players especially on the supply side. Equally so regulatory risk throws a shadow over how much of the price movement can be passed on to the consumer. The UK had an oversupply of capacity but in the advent of an aggressive upward move in power the consumer could absorb some of this risk. The state of California however, had quite the opposite situation. Therefore a study of how the American Market deals with regional and inter-regional supply and demand might go some way to diminishing a potential crisis such as the Californian power crisis or indeed the New York blackout that recently happened.

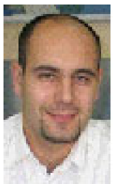
One of the major challenges the Russian power market will face when deregulated is credit risk between counterparties. This is indeed a major stumbling block for the current markets except the Nordic where business flows through an exchange. There is a general need to look at the experiences of companies trading in deregulated markets worldwide, the issues they face, the applicability of these issues in Russia and how these are best dealt with in a Russian context.

3. In conclusion, does the company lead the traders or do the traders lead the company?

If a company is project financed then it is safe to say the lenders have a degree of input into how matters are run. Within a company a policy of open communication between traders, management and operations/maintenance is essential. There are occasions when these groups have disagreements and different ideas and an understanding of each other's role helps. From a regulated to a deregulated market the shift of focus and communication to a trading desk is instrumental in order to gain advantage for the company. It is obvious that some companies in the United Kingdom hold different emphasises on how much impact trading teams have on the leadership of their respective companies. Evidence of speculative trading shows how some companies have given much freedom to their traders to explore the market and to fully maximise the markets potential. Other companies cannot justify the risk involved and will only operate in the market to trade their portfolio. The answer is that a symbiotic relationship between the trading team and the company is essential to advantageously manage operational risk, regulatory risk and market risk to extract added value and maintain a competitive position within the new environment.

/BEST will try, with Your help, to present international experiences with deregulation of power sector in sense of electricity market liberalization and in sense of changes from the aspect of the ownership. BEST invites You to present short materials related to deregulation in different countries. BEST hope to get Your feedback, therefore thank in advance for Your work. /

Transfer Capacities in Liberalised European Electricity Markets



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Association of the European Transmission System Operators (ETSO), worked out a vast number of definitions in the field of transfer capacities which unification shall help to better understandings between Transmission System Operators (TSOs), as well in their relation with companies who do businesses in trading of electrical energy.

Transfer capacities are basic element of the international trading of electrical energy since determines availability of accessing regional markets. Therefore it is of special importance that transfer capacities are calculated on defined, publicly known and transparent way, where used definitions are well understood to all market participants including local market regulator appointed by the State.

Due to misunderstanding of nouns regarding transfer capacities easily can happen, and usually happens, to have confusion in academic and public society. Confusion arises due to non-distinguishable relations of mathematically calculated transfer capacities (NTC) and physical (real) load flows in the high voltage power tie lines. Therefore at the beginning it is absolutely necessary to make distinguishable between real power flows through the HV tie lines, from one side, and mathematically calculated values for transfer capacities in use for concluding trading agreements with electrical energy, on the other side.

Since electrical energy market participants for primary goal has to plan trading between Countries and Regions, for them is important to know, in the initial stage, how much energy may agree in the contract with their partner. As well, not all market participants shall be interested in what are the real power flows in the tie lines and if their potential contract endangers safe operation of the power system, since care of the safe system operation and real load flows notification is business of the Transmission System Operator (known as TSO). Therefore to the market participants is available to get values regarding transfer capacities through the system services of the TSO, whose business is to calculate this values accurate based on latest available data, from one side, and to care about physical power flows and power system stability, on the other side.

Complex businesses of the TSO are therefore done within TSO in order not to become issue of every market participant. Due to the role which TSO holds in the electricity market it is insisted on its neutrality, non-discriminatory, transparency and high regularity of its steps in bringing decisions that effects market participants, as well as it is a must that work of a TSO is supervised by the market regulator who is further appointed by the State.

In order of transparency and neutrality of the TSO, it is necessary to have harmonised basic procedure for calculations of transfer capacities within the TSO, as well between two or several TSOs on the region or international level. This certainly means that basic scenarios of physical load flows shall be checked and mutually agreed between TSOs.

Definitions that follow in this paper are of great importance for all players in the electricity market in order to prepare their commercial agreements regarding transactions with electrical energy. Physical complexity shall be considered in the frame and between TSOs. On the other side, TSO is responsible to its Regulator, and to the Authority in sense of running its business in fair, non-discriminatory way. Anyhow, other electricity market participants shall not be involved into TSO's businesses of transfer capacities values calculations.

In the text that follows next international abbreviation introduced by ETSO-a will be in use:

TTC – Total Transfer Capacity
NTC – Net Transfer Capacity
AAC – Already Allocated Capacity
ATC – Available Transfer Capacity
TRM – Transmission Reliability Margin
NTF – Notified Transmission Flow
TTF – Total Transfer Flow

TTC is calculated starting from Base Case Exchange model (BCE) by means of computer simulations. The simulation contains all in advance long-term planned agreements as well technical state of the power system. BCE model shall be made separately for every tie line and considers generation and consumption in the two areas, which that tie line connects.

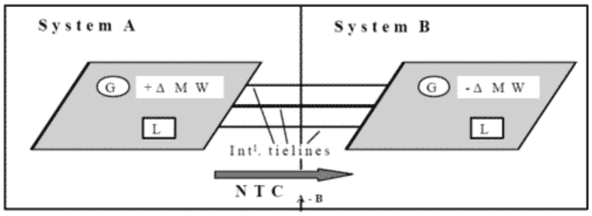


Figure 1, example of two mutually connected power systems for the purpose of BCE calculation. L means “load” (consume, demand) , while G means “generation” of electric energy. Source: ETSO, link: http://www.etso-net.org/upload/documents/NTC%20Users%20information.pdf

Def. – TTC (The Total Transfer Capacity) that is the maximum exchange programme between two areas compatible with operational security standards applicable at each system if future network conditions, generations and load patterns where perfectly known in advance.

The uncertainties associated to forecast of the power system state, for a given time frame in the future, may lead into changes. Therefore the values for TTC might change (whether to increase or decrease) when approaching the time of programme execution due to the availability of new, more accurate and direct data regarding state of generation, network topology, load profile and availability of the tie-lines.

Def - TRM (The Transmission Reliability Margin) which is a security margin that copes with uncertainness on the computed TTC values arising from:

- Unintended deviations of physical flows during operation due to the physical functioning of load-frequency regulation
- Emergency exchanges between TSOs to cope with unexpected unbalanced situations in real time
- Inaccuracies, e.g. in data collection and measurements

TRM is associated to the real-time operation and its value is determined by each TSO, in order to guarantee the operation security of its own power system. TRM may vary seasonally or may be updated according to possible modifications occurred in the power system.

Def. – NTC (The Net Transfer Capacity) is the maximum exchange programme between two areas compatible with security standards applicable in both areas and taking into account the technical uncertainties on future network conditions. NTC is defined as:

NTC = TTC – TRM

TTC, TRM i NTC can vary in different timeframe (one year, month, week or a day).

NTC may be allocated in different time frames to match the need for securing longer term trading and to provide room for shorter term trading. One may distinguish, as the result of the allocation procedures in each allocation time frame, two notions:

Def. – AAC (The Already Allocated Capacity) that is the total amount of allocated transmission rights, whether they are capacity or exchange programmes depending on the allocation method.

Def. - ATC (The Available Transfer Capacity) that is the part of NTC that remains available, after each phase of the allocation procedure, for further commercial activity. ATC is given by the following equation:

ATC = NTC - AAC

AAC and ATC are thus a result of each stage of the allocation procedure.

The following figure gives an overview over the transfer capacity definitions.

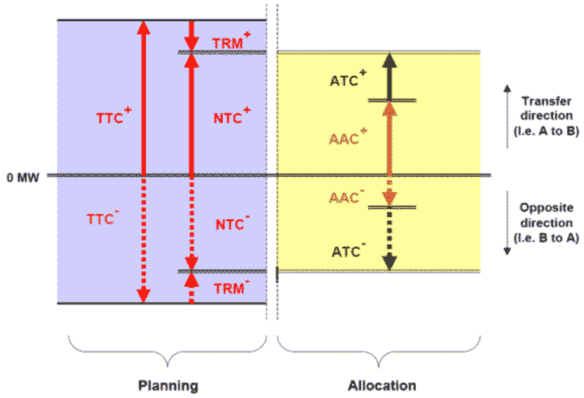


Figure 2, Transfer capacities definition. Source: ETSO, http://www.etso-net.org/upload/documents/NTC%20Users%20information.pdf

Physical (real) load flows over the tie lines in the meshed power systems (as UCTE) are very different from the concluded transactions (deliveries). In reality there are so called parallel load flows, which relates to some other agreed transactions since in physical sense this delivery can flow through any possible path. Overall picture of load flows over the tie lines is coming from the "superposition" of all generators and loads (consume). It is important that in absolute values generation and consumption are balanced, where all deliveries are covered with the concluded agreements and to have stabile operation of the power system. Allocation of the transmission capacities beside others has to purpose to secure stable operation of the power system. Technically speaking real superposition of all generators and loads is not most accurate calculation due to the non-linear behaviour of the power systems, but with certain linearization superposition can be applied and is applied in practice.

Complexity of the load flow issue is given in the following example. This example is done for the case of increasing the generation of 100 MW in Belgium and same time increasing consumption in Italy for the same amount, where generation and consumption in other systems (countries) is nominal and unchanged. So if one company buys electrical energy of 100 MW power in Belgium and sells this energy in Italy, this electrical energy will from its source (Belgium) till its end (Italy), in physical sense, find it way over all possible and available paths over the high voltage lines in accordance with the laws of electrical engineering.

Figure below shows accurate values of load flows over the all tie lines in the region. On the other side, between Belgium and Italy most direct path leads through France, so in commercial agreement it will be favourable to provide 100 MW transfer capacities on the borders between Belgium and France, as well France and Italy. To conclude this agreement will be necessary to apply to the TSOs in Belgium, France and Italy. What so ever, in case of positive answer from the TSOs the commercial agreement will have fulfilled transaction conditions and will be possible to conclude. The one will notice that real load flows are not taken into the consideration by the trading company?! In fact, each of the TSOs was making independent calculation (checking) how will increasing in generation of 100 MW in Belgium and same consumption in Italy reflect on (affect) their power systems stability. After TSOs concluded that potential agreement is not endangers power system stability, they agree to offer transfer capacities at the borders of their power systems.

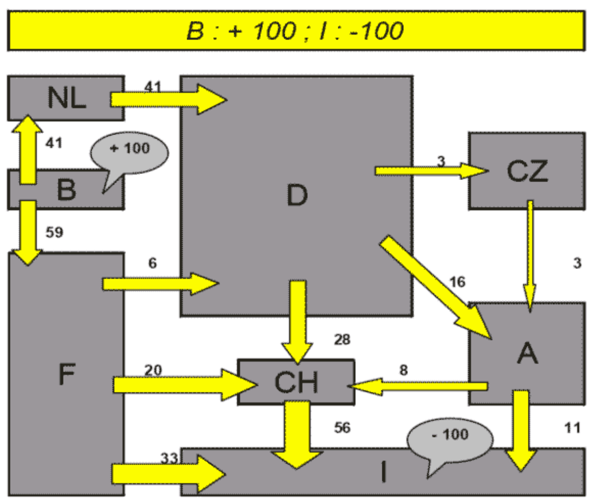


Figure 3, Example of European load flow for an export of 100MW from Belgium to Italy. Source: ETSO, link: http://www.etso-net.org/upload/documents/NTC%20Users%20information.pdf

In order to have fair evaluation of the physical usage of the transmission lines by real load flows and to have pricing in accordance with their usage, there are developed certain funds, so called CBT mechanisms (Cross Boarder Trading mechanisms for over boarder trading of electrical energy). These mechanisms are related to the certain region that includes several countries. When international agreements of buying and selling of electrical energy are concluded company needs to pay fix, prescribed amount of money into the fund for a purpose of the power lines usage. At the end of the year, when all real load flows are known over the high voltage lines, from the fund, in accordance to the lines usage, on each TSOs account will be paid correspondent amount of money. Amount of money will relate to the usage of the power lines of the TSO, for the previous year.

Example from above is interesting sine it determines one more feature close to the calculation of NTC. After the conclusion of the agreement of selling 100 MW from Belgium to Italy, this arrangement, due to physical load flows, influenced changes of all future NTCs on all boarders where this electrical energy physically passed!? Therefore in future, after the conclusion of agreement, all TSOs will have to include this new agreement into the NTC calculation. Definitively, with the inclusion of this new agreement and due to its physical delivery influence on the power systems stability, all NTCs on all boarders will be changed at least for little. At some capacity will increase and on some will decrease, depending on load flows directions.

Complexity in the sense of context between NTC which are issued by the TSOs and the real power flows over power systems tie lines is best illustrated from the online figure of the Hungarian TSO MAVIR that shows current load flows, link: http://www.mavir.hu/verdata/act/index.htm and values from the indicative NTC in the directions of Hungary published by ETSO's website, on the link: http://www.etso-net.org/MarketInfo/ntc_info/map/e_default.asp (click on the red dots at he figure so to get NTCs for the chosen border).

By simple comparison of the mentioned numbers is far not possible to find the relation between published NTCs and the real notified load flows. Reason is simple, it is about complex interconnection within meshed power system, while NTCs are calculated by mathematical calculations according to agreed rules.

What follows is a pair of definitions relating physical capacities:

Def. – TTF (The Total Transfer Flow) is the net physical flow across the border associated with a programme exchange of magnitude TTC, provided that no other exchanges have been modified with respect to the ones existing in the base case.

In this limited context – the one which applies to TTC computation – TFF may be understood as the physically maximum cross-border flow compatible with security standards in each control area. TTF may be greater or smaller than TTC. TTF can be split into two terms

$$TTF = NTF + \Delta F_{max}$$

Def. – NTF (The Notified Transmission Flow) which is the physical flow over the tie lines between the considered area observed in the base case prior to any generation shift between the areas

NTF is result from the flow originated by the base case (BCE) and from the parallel flows. It is extremely difficult and often even impossible to identify the different origins of parallel flows that lead to the NTF value and to separate them into distinguished terms (such as loop flows, natural flows) because of non-linear physical phenomena in the networks.

A split of NTF is technically not necessary for the procedure of transfer capacity assessments and would also not be relevant for market players.

Def. - ΔF_{max} (The Physical Flow) jis the physical flow over the tie lins between the considered areas included by the maximum generation shift ΔE_{max}

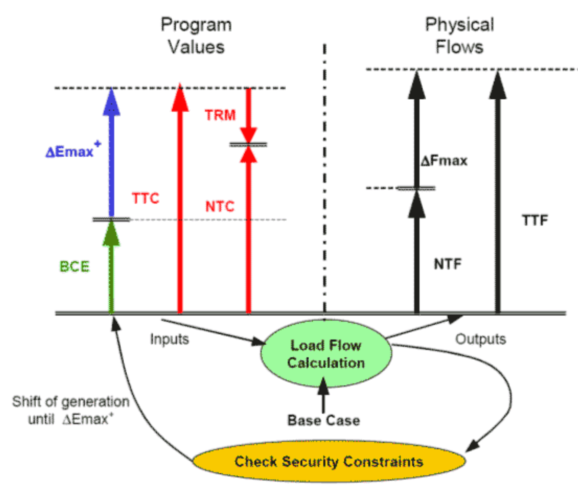


Figure 4, Definitions of transfer capacities and physical flows. Source: ETSO, http://www.etso-net.org/upload/documents/NTC%20Users%20information.pdf

This paper presented in short the interpretation of the transfer capacities as well their importance and role in the regional trading with electrical energy. Importance of the accurate calculations of the NTCs at the same time draws the importance of the TSO's work as well its regional cooperation with other TSOs. Non-discriminatory, transparent and regulated work of the TSO is the essence for the development of the unique regional electricity market for the Southeast Europe Region. For the correct operation of the TSO certain State regulatory (supervisory) body is appointed. By default it is Regulator Agency.

In fact, the deregulation of the power sector requires bigger regulation in sense of law and acts, which are defined by the local regulator authorities. These authorities are also involved in the supervision of the companies such as TSO but also are monitoring behaviour of all market players. As well state bodies as Regulator Agency maintains inside electricity markets in their countries. Since international trading of electrical energy is happening every day (including the present time when we here are speaking about it) it is necessary for the Balkan Region to have created preconditions for the operation of the efficient, transparent and non discriminatory regional electricity markets what will operate at the upper level compared to the present, maybe to have market same as European Union has.

Biographie:

***Aleksandar Katančević** was born in Pirot, Yugoslavia, on August 12, 1977. MSc. Degree in Electrical Engineering was granted with thesis work: "Transient and Dynamic Stability on Wind Farms," by Helsinki University of Technology, in 2003. He gains strong internship-based working experience within power systems companies: ABB Power Systems AB in Ludvika, Sweden, working with HVDC Transmission Systems. ABB Corporate Research Ltd. Utility Solutions in Baden-Dättwil, Switzerland, focused on electromechanical oscillation issues and computer based system simulations. He is an IEEE, PES, and CS Student Member. Special interests in HVAC and HVDC Transmission Technology, Wind-Energy, Electromechanical Oscillation, partly Electricity Markets.*

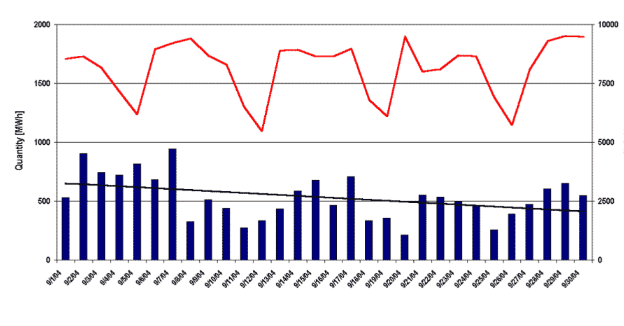
Trading on the Slovenian Power Exchange in September, 2004

For BEST: *Borzen management*

HIGHER PRICES IN SEPTEMBER

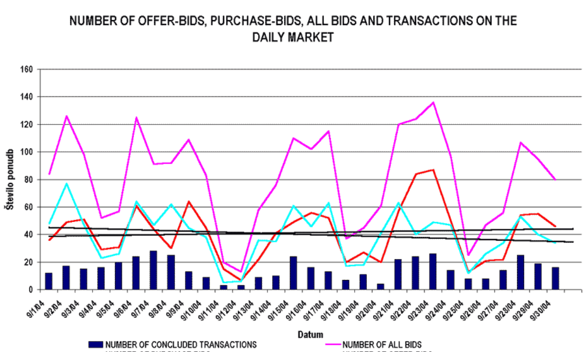
There was a decrease in the volume of trading on the market in September. Trading volume decreased for 38% compared to trading in August and reached 15,977 MWh. Consequently decreased also average daily volume of all transactions, it fell from 825 MWh in August to 533 MWh in September. In the first week of September were the volumes on the market still on the level of August, but than the volume of trading slowly began decreasing to the values between 500 MWh and 700 MWh. There was a yearly refit of Nuclear power plant Krško in September, but it did not reflect on the market; it was planned and the suppliers were already prepared for it. The prices on the market were 8.2% higher in September than in August. The average monthly index SLOeX for August is 8,147 index points; the maximal value of SLOeX is 9.531 and was reached in the last week in September. Maximal daily volume of sold energy was 944 MWh and was reached on Tuesday, 7th September.

TOTAL VOLUMES ON THE DAILY MARKET AND INDEX SLOeX IN SEPTEMBER 2004



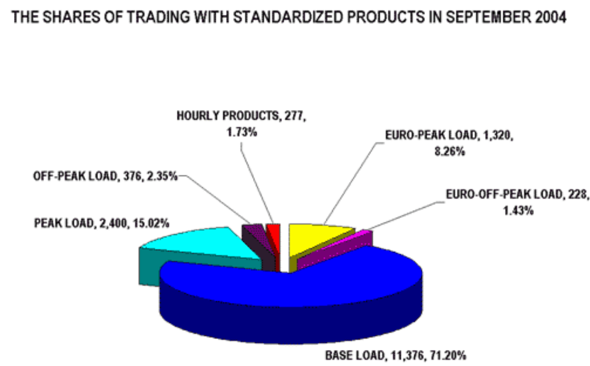
OFFER-BIDS AND PURCHASE BIDS BALANCED ON THE MARKET

The number of bids on the market is this month a bit lower than in the last month. In August the total number of all bids amounted to 2,601 bids and in September this number decreased for 8% to 2,379. In August the number of purchase-bids exceeded the number of purchase bids, but in September were the numbers of both of them quite balanced. The number of offer bids reached 1,270 in September and the number of purchase bids 1,233. But that does not necessarily mean that there was always enough supply of energy on the market. It frequently happened that at the end of the trading the book of offer-bids, especially of the product base load, remained empty. If we add the trendline to the curve of offer-bids and purchase bids we can observe that the number of offer bids is slowly decreasing and the number of purchase bids increasing.
The number of concluded transactions on the market varied depending the day of the week. On weekends there were fewer transactions concluded and also fewer bids entered, whilst during the week more transactions were concluded based on greater number of bids.



AN INCREASE IN THE SHARE OF PRODUCTS EURO-PEAK LOAD AND EURO-OFF-PEAK LOAD

Base load product prevailed in the volume of trading this month. Its share was somewhat higher than in the previous month but it was still lower than in the months before August. Products peak load and euro-peak load still hold an important share in the total volume of trading. These two products are also the cause for higher values of index SLOeX during the last period. There is still a big difference in quantity and structure of total trading volume between trading on the weekdays and trading on weekend. On the weekends is normally the share of base load product higher, sometimes it reaches even 100% and during weekdays it even falls to around 40% of total volume of trading, than products peak load and euro-peak load prevail. The main reason for this situation is sufficient supply of peak load product and euro-peak load, whilst there is a lack in the supply of base load product on the market.



AN INTRODUCTION TO THE

GENERATION AND TRANSMISSION MAXIMIZATION MODEL (GTMAX)

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Generation and Transmission Maximization Program (GTMax)

Overall Description:

Argonne National Laboratory developed the GTMax model to simulate complex electricity market and operational issues, both for competitive and regulated environments. With the aide of GTMax, utility operators and managers can maximize the value of the electric system taking into account not only its own limited energy and transmission resources but also firm contracts, independent power producer (IPP) agreements, and bulk power transaction opportunities on the spot market (**Figure 1**).

****

GTMax simulates the dispatch of electric generating units and the economic trade of energy among utility companies using a network representation of the power grid. Generation and energy transactions serve electricity loads that are located at various locations throughout the simulated region. Links and transformers connect generation and energy delivery points to load centers. Electricity loads are satisfied, curtailed via contractual agreements, or not served due to a generator supply shortage or because of transmission limitations.

The objective of GTMax is to maximize the net revenues of power systems by finding a solution that increases income while keeping expenses at a minimum. When multiple systems are simulated, GTMax identifies utilities and projects that can successfully compete on the open market. The model computes and tracks hourly energy transactions, market prices, and production costs. Using a mixed integer Linear Programming (LP) approach GTMax simultaneously solves the maximization objective for all hourly time steps in a weekly simulation period. The model can be run for all 52-weeks in a year or for selected representative weeks.

Simulated activities are driven by energy market forces and are performed within the physical and institutional constraints of the interconnected systems. Some limitations that are modeled include power plant seasonal and hourly maximum and minimum generation levels, limited energy constraints, contractual transmission capabilities, and terms specified in firm and IPP contracts. GTMax also considers detailed operational limitations such as power plant ramp rates and hydropower reservoir constraints. Firm transmission contracts, along with Transmission Reliability Margins (TRM) and Capacity Benefit Margins (CBM) are also factored into model simulations. GTMax computes Available Transmission Capabilities (ATC) for each transmission link, over Composite Transfer Capability (CTC) link groups and over user-specified pathways.

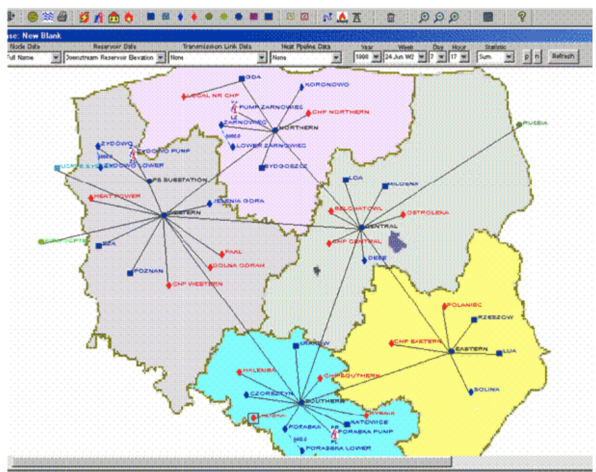


Figure 2. Topology of the Polish power grid used in the GTMax model.

The GTMax model is designed to be user-friendly. It operates under a Microsoft Windows environment and employs a Geographical Information System (GIS) interface. The model is very versatile in that the user starts with an empty workspace and builds a power system topology of system components and interconnections using mouse point and click actions. By clicking on a map of utility power plants and transmission lines, input data can be viewed and modified. **Figure 2** shows a GTMax representation of the Polish power grid.

GTMax can also be used to analyze market potential for power transactions via proposed transmission lines among neighboring electricity systems. **Figure 3** shows the topology of the GTMax representation developed to analyze proposed interconnections between power utilities in Macedonia, Bulgaria, and Albania.

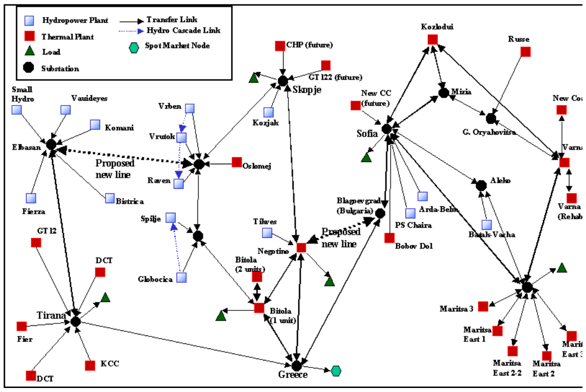


Figure 3. Interconnected System for Albania-Macedonia-Bulgaria in GTMax

GTMax output provides such information as which units should be dispatched, how much power should be generated and sold on an hourly basis, when to buy and sell power on the spot market, the cost of alternative power plant operations, the incremental value of water, and the value of demand-side management programs. As an illustration, **Figure 4** shows projected power transactions (computed with GTMax) among three utility systems during a typical week in fall 2005. **Figure 5** illustrates the corresponding market-clearing prices for power transfers among the three utilities during that same week.

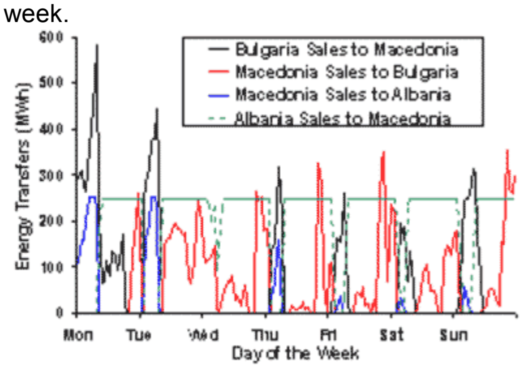


Figure 4. Expected Power Transfers

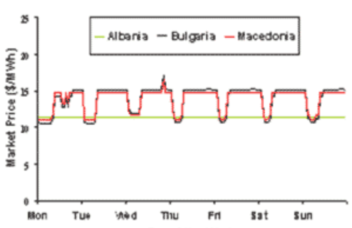
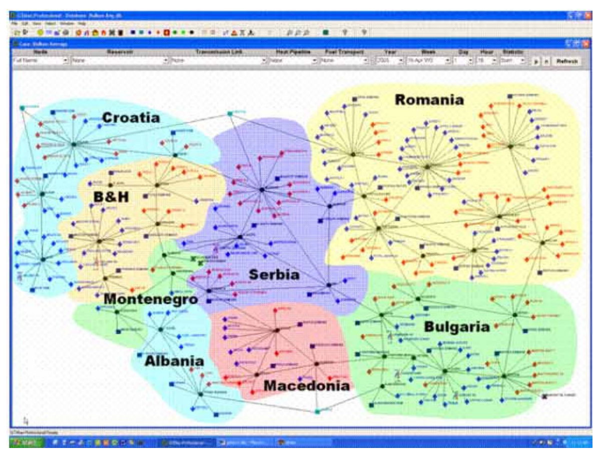


Figure 5. Market-Clearing Prices

As mentioned above, in 2002, the GTMax software was utilized under an USAID funded project to analyze an envisioned Regional Electricity Market (REM) for Southeast Europe (SEE). A Memorandum of Understanding (MoU) on the REM in SEE and its Integration into the European Union Internal Electricity Market was signed at the ministerial level in Athens on November 15, 2002. Under the MoU, all governments in the region expressed a strong commitment to work towards the objectives of the SEE REM. During the meeting in Athens, it was concluded that the regional needs in power generation are poorly understood due to lack of analysis of regional supply and demand balance. It was also agreed that the EC and the World Bank will supervise a study to determine a regional generation expansion plan and associated investment needs based on regionally available energy resources and the demand and supply balance over the next 15 years (2005 – 2020). This study will be carried out using WASP and GTMax models. The following screen capture presents a network representation of a GTMax reference case developed for the SEE REM.



GTMax worldwide clients include electric utilities, government institutions and regulatory bodies, power merchants, transmission companies and research institutes, which use this software to:

- Evaluate investment options in new generation and transmission assets
- Evaluate firm contracts, energy exchange agreements, and IPP agreements
- Estimate available transmission capability
- Optimize hydro and thermal generation
- Develop optimized spot market strategies

- Project regional hourly market clearing prices under different market rules and bidding strategies
- Analyze the effect of potential legislation on the electricity market
- Analyze competitiveness of individual generators to assess stranded cost issues
- Analyze potential for distributed generation and demand side management (DSM)
- Compute the cost associated with environmental legislation

Sample Applications:

Sample applications, including the following:

- In October 2002, the US Agency for International Development (USAID) contracted Adica Consulting to provide licensing and training in the use of GTMax for 15 electricity companies in Southeastern Europe.

- Under the Southeast European Cooperative Initiative's (SECI) Project Group on "Development of Interconnections of Electric Power Systems of SECI countries for better integration to European System," Argonne National Laboratory collaborated with Montgomery Watson Harza (MWH) in using GTMax to analyze an envisioned Southeast-Europe Regional Electricity Market (REM) that would initially comprise at least seven countries, including: Albania, Bulgaria, Bosnia and Herzegovina, Croatia, Macedonia, Romania, and Yugoslavia. In this analysis, GTMax was used to estimate the economic benefits of implementing the REM by calculating hourly market prices of electricity at each market hub in the regional electricity network for cases where individual electric systems operate independently, and individual electric systems operate jointly in a regional electricity market. The analysis also investigated the operation of individual hydro and pumped storage power plants to assess their role and value in developing an efficient and reliable regional electricity market.

- A large U.S. utility company uses GTMax to determine hourly, weekly, and seasonal power and energy offers to customers and fine tune hourly resource generation patterns, spot market transactions, energy interchanges, and power wheeling.

- A large U.S. energy marketing office uses GTMax to identify operational strategies that optimize the value of company resources while taking advantage of market opportunities.

- The U.S. Bureau of Reclamation uses GTMax to compute the economic and financial costs associated with environmental restrictions on hydropower operations.

- A large international power merchant used GTMax to assess the financial viability of two transmission line projects in Southeastern Europe. This analysis demonstrated anticipated savings between $900 million and $1.4 billion by expanding the regional transmission grid.

- The Polish Energy Market Agency used GTMax to estimate the competitiveness of small gas-fired cogeneration in Poland's newly restructured energy markets.

- A large U.S. utility company uses GTMax to compute available transmission capabilities for future postings on regional Open Access Same-time Information Systems (OASIS).

Differentiating Factors:

- The GTMax model is a copyrighted software program that was developed by Argonne National Laboratory. The model is unique in that it performs power market simulations of the open market that simultaneously account for both physical and institutional limitations in the thermal, hydro, and transmission systems.

- In September 2002, USAID's Information Resources Management (IRM) Consulting and Information Resources (CIS) Division conducted a Project-Funded Information Technology Review (ADS 548) of the GTMax software. The factors considered during this review, include: Suitability of required hardware; Cost-effectiveness of the software solution; Maintenance; Training; Staffing; and Host country institutions' discipline in managing information resources. Upon completing this review, USAID authorized the sole-source purchase of 15 GTMax licenses.

- The model solves the power market problem for weekly simulation periods using hourly time-steps. GTMax operations ensure that the physical system is within hourly-specified limitations and that transactions under bilateral agreements follow contractual specifications. Special market nodes in the model allow the user to estimate the amount of power that can be economically purchased or sold to neighboring power systems or countries. These nodes along with a contractual representation of the transmission system allows the user to estimate the profits that can potentially be made by wheeling power from one system to another.

- GTMax has a detailed representation of many different components of the power system. Nuclear, baseload thermal, cycling, and peaking power plants can all be characterized in the model. There is also a special representation for Combined Heat and Power (CHP) plants that are primarily operated to meet either heat or power demands. The types of hydropower plants that can be simulated include storage units, run-of-river power plants, and pumped storage. Hydropower plants can also be specified in a cascade such that reservoir water levels remain within physical and institutional operating levels.

- The GTMax model is very flexible since operational limitations can be specified on different time scales. For example, unit generation capability can be specified on an hourly basis to account for the effects of the ambient air temperature on gas-turbine operations. GTMax also has hourly specifications for minimum generation levels, up and down-ramp rates, and bidding curves. On a longer time scale, the GTMax model will limit simulated operations such that water releases from hydropower dams are at specified levels.

- Contractual power flow limits in the model are also specified at a very fine level of granularity. Power flow limits are hourly and bi-directional. Transmission considerations, such as capacity that is reserved for bi-lateral transactions, TRM, and CBM can all be specified in GTMax. The model also allows the user to simultaneously limit transactions that flow into or out of a region over several interfaces using CTC constraints. The transmission system in GTMax can also simulate power exchanges with another systems through the use of power exchange nodes that are located at user specified points in the network.

- GTMax also simulates bilateral contracts for either purchasing or selling power. Some of the contractual terms that can be simulated by GTMax include: weekly minimum and maximum energy levels, constraints on daily transaction levels, hourly maximum Contract Rate of Deliveries (CROD), block-level pricing that varies by both the day of the week and by hour of the day, and power delivery point. Power inter-changes agreements can also be simulated.

- On the demand-side of the power equation, the GTMax model includes an hourly representation of residential, commercial, and industrial electricity demands at user-specified load centers. Demands that are served by the power sector are a function of electricity price. When the locational market price in the network reaches or exceeds a user-specified level, a DSM program for that region will reduce system loads.

- GTMax has a point-and-click interface that uses a node and link representation of power system components including power plants, load centers, interties with other power systems, transmission lines, and bi-lateral contract delivery points. The model can represent the power system with varying levels of detail and provides a very useful geographical interface, which makes GTMax a unique tool for analyzing a wide range of current priority issues and problems associated with electricity systems that operate in both competitive and regulated environments.

<u>System Requirements</u>:

The GTMax software is configured to operate on a high-end personal computer (i.e., a PC having at least 256 MB RAM, 750 MHz processor, and 200 MB of available hard drive space) operating under MS Windows 98, Millennium, NT, or XP.

News Release

Iris Power Engineering has been working with the New York Power Authority (NYPA) to develop HydroX, the world's first continuous monitoring expert diagnostic system for hydro turbines and generators. HydroX will utilize Bently Nevada's System 1™ Plant Asset Management software with embedded Decision Support capabilities to combine vibration, temperature, operating point, and air gap data from Bently Nevada's 3500 series machinery protection system with data from Iris's HydroTrac™ partial discharge monitoring instrument. System 1 will also be used to collect and process variable data from the unit through interface with the plant's control and SCADA systems. The system will be installed in September 2004. If you have any questions regarding this project, please contact Misak Krikorian, NYPA at 914-287-3967 or Blake Lloyd, Iris Power Engineering at 416-620-5600 extension 222.

Bently Nevada is a leading global supplier of products and services for assessing and ensuring the mechanical and thermodynamic health of industrial equipment. The company maintains nearly 100 offices in the principal industrial centers of 43 countries, serving a broad base of more than 25,000 customers in the power generation, petrochemical, and numerous other industries. Bently Nevada is a GE Energy business. Iris Power Engineering Inc. develops and manufactures diagnostic equipment to determine the ongoing condition of the electrical insulation in large motors and generators. Products include electrical sensors, electronic instruments, and expert system software. Iris also provides extensive education and training on motor and generator maintenance.

New Tools Available to Determine Stator Winding Insulation Condition

For several decades, owners of large motors and generators have used partial discharge (PD) testing to determine when repairs or rewinds are needed. However, no limits were published on what is a safe PD level.
With the recent collection of over 60,000 test results into one database, statistical analysis has shown that objective *"safe"* and *"high"* PD levels can be established. The *"safe"* PD levels mainly depend on the voltage class. However, as shown in the figure below, some machine manufacturers have higher PD levels (and thus more rapid deterioration) than others.

The data was collected from thousands of motors and generators, using 80pF and SSC PD sensors. The data was automatically purged of electrical interference using the noise separation methods developed by Iris staff for the Canadian Electricity Association and EPRI.

For copies of the statistical summary as presented at Iris' annual Rotating Machine Conference (IRMC) in 2004, please contact Iris Power Engineering at sales@irispower.com, www.irispower.com or call 416-620-5600.

Conferences

The Implementation of EU directives on energy use and environmental protection (9.-10.11.2004)

On November 9th - 10th, the Congress Centre in Prague will be hosting the ninth international EEBW: Energy Efficiency Business Week conference. This year is subtitled "The implementation of EU directives on energy use and environmental protection" The conference is being held under the auspices of the Czech Minister of Industry & Trade and the Czech Minister of the Environment and will be open by Mr. Ambrozek, Minister of the Environment.

Among the themes to be discussed are the directives on the liberalisation of the electricity and gas markets, on the energy performance of buildings, and on renewable energy sources, as well as the directive in preparation on energy end use efficiency and energy services.

The Conference is organised by:
SEVEn, o.p.s.
Americká 17 120 00 Prague 2
Čzech Republic
Tel.: +420 224 247 552
Fax: +420 224 247 597
GSM: +420 602 242 311
eebw2004@svn.cz
www.svn.cz, www.eebw.cz

Petra Neuwirthová

Delivering Power Quality in the Enlarged EU

In June 2005, European Power News and International Power Generation magazines are holding a two-day conference in Budapest on Delivering Power Quality in the Enlarged EU. The conference title is CEE Power Conference 2005.

This is the follow on from the very successful event, Modernising Central European Electricity Markets, which you were kind enough to include in your newletter.

Attached is a copy of the conference programme - the event will cover power quality issues from distributed power back-up solutions through to management of major grid incidents.

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Adam Smith CONFERENCES

Adam Smith Conferences 3rd Annual Forum on
The Russian Electricity & Gas Sectors
2nd - 4th November 2004, Marriott Grand Hotel, Moscow

http://www.adamsmithconferences.com/html/conference_html/energy/energy_nov04.html

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ViaExpo
ORGANIZERS OF PROFESSIONAL EXHIBITIONS

INTERNATIONAL CONGRESS ON ENERGY EFFICIENCY and RENEWABLE ENERGY SOURCES in Industry Sectors and Construction
April 13-15 2005, Bulgaria

Under the auspices of the Bulgarian Ministry of Economy and the Ministry of Regional Development and Public Works

The **main issues** of the Congress are: EE in the industry and construction, benefits and application of RES. The target of the Congress is to raise the awareness for the different ways of energy consumption reduction in the buildings and industry so to have a higher competitiveness among the companies and better and sustainable life of the citizens in Bulgaria and South East Europe.

Congress Topics:

1. **European policy concerning the Energy savings and RES in buildings and industry sectors.**
   - The level of Energy savings policy implementation in Bulgaria and in the region.
   - Trade of CO2 emissions.

2. **Presentation of the Buildings Directive "Energy Performance of Buildings**", for sustainable buildings,
   - Rehabilitation of panel buildings and social houses,
   - Labeling and Certification
   - EE education.

3. **Renewable Energy Sources - possibilities and barriers in the region**:
   - Current situation and trends for RES development and application for obtaining energy
   - Renewable heating and cooling;
   - Impacts on the environment;
   - Discussions on case studies;
   - Financial Supporting schemes and instruments for implementation and promotion of RES in Europe and in the Region;

Important Dates:

30 of September 2004 - abstract submission - One page A4
1st of November 2004 - acceptance verification
3rd of January 2005 - papers submission

Organiser:
Via Expo
www.viaexpo.com
00359/32/945459/960012/960011
Project Manager - Maya Kristeva - mob 00359/888/926587
Office@viaexpo.com

The global investor's Gateway to Romania
http://www.investromania.ro

International Conference - Power Plants 2004
Energy resources, energy efficiency, ecological and operational aspects of power plants.

November 2-5 November 2004, Vrnjacka Banja, Serbia and Montenegro

Organizing Committee

All correspondence with the Organizing Committee relating organization of the Symposium on the following address:
Dr. Vukman Bakić, Secretary of Organizing Committee
Society of Thermal Engineers of Serbia and Montenegro
P.O. Box 522, 11001 Belgrade
Serbia and Montenegro
Tel/fax: + 381 11/ 344 34 98, 245 36 70
E-mail: simpozijum.termicara@vin.bg.ac.yu

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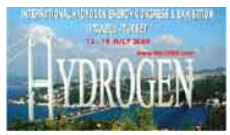
5 – 10 June 2005, DUBROVNIK CONFERENCE ON SUSTAINABLE DEVELOPMENT OF ENERGY, WATER AND ENVIRONMENT SYSTEMS, Dubrovnik – Croatia
http://www.dubrovnik2005.fsb.hr
dubrovnik2005@fsb.hr

HYDROGEN - *FIRST ANNOUNCEMENT & CALL FOR PAPERS - INTERNATIONAL HYDROGEN ENERGY CONGRESS & EXHIBITION, "RECENT ADVANCES IN HYDROGEN ENERGY TECHNOLOGIES", 13-15 JULY 2005, ISTANBUL-TURKEY (www.ihec2005.com)*



Istanbul is preparing to become an important international center for hydrogen energy. An agreement was reached and finalized on the 21st October 2003 between the Turkish Government and UNIDO to establish the International Center for Hydrogen Energy Technology (ICHET) in Istanbul. This meeting aims not only to celebrate the event but also to recognize the contributions of Prof. Veziroglu, by bringing together academic and industrial organizations related to the Hydrogen Energy Sector, facilitating communication and promoting the use of hydrogen as a fuel. The Conference will address scientific and technical issues related to hydrogen energy together with economic and national policies.

CONGRESS TOPICS

- *Hydrogen Production Technologies*
- *Hydrogen Storage and Transportation*
- *Hydrogen Utilization*
- *Hydrogen Energy Systems*
- *Hydrogen Safety*
- *Hydrogen Energy Economy*
- *Fuel Cells*
- *National/International Perspectives*
- *Environmental Issues*
- *Financing*
- *Social Acceptance*

- *International Implications*

October 31st 2004 One pagee abstract due
March 1st 2005 Camera-ready manuscript due
April 1st 2005 Deadline for advanced registration
http://www.ihec2005.com, secretariat@ihec2005.com
Or contact

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For BEST: Prof. Dr. I. Engin Ture

2004 European Wind Energy Conference & Exhibition
22-25 November, London, UK

http://www.ewea.org/06b_events/events_2004EWEC.htm

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www.elsol.co.yu
Elsol – production and instalation of solar equipment, Serbia and Montenegro

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www.intuser.net

Programmes, informations, other topics

www.eucenter.org

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Balkan Energy Solutions Team – BEST
October 2004

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